Exhibit A

Disclosure SJO8-1999-0443

Created By: Kevin Smith   **Created On:** 12/13/99 12:59:01 PM
Last Modified By: Marie Turley   **Last Modified On:** 02/14/2000 02:39:07 PM

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Required fields are marked with the asterisk (*) and must be filled in to complete the form.

Summary

Status	Search Results Received
Processing Location	SJO
Functional Area	Test & Performance Systems - Truskowski
Attorney/Patent Professional	Randall J Bluestone/San Jose/IBM
IDT Team	Clod Barrera/San Jose/IBM; Brian Smith/San Jose/IBM; Wynn Price/San Jose/IBM; Homayoun Samadi/San Jose/Contr/IBM
Submitted Date	12/13/99 03:43:08 PM
Owning Division	SSD
PVT Score	To calculate a PVT score, use the 'Calculate PVT' button.
Lab	
Technology Code	

Inventors with Lotus Notes IDs

Inventors: Kevin Smith/San Jose/IBM

Inventor Name > denotes primary contact	Inventor Serial	Div/Dept	Manager Serial	Manager Name
>Smith, Kevin F	156051	35A/35A	422639	Smith, B.J. (Brian)

Inventors without Lotus Notes IDs

IDT Selection

IDT Team	Attorney/Patent Professional
Clod Barrera/San Jose/IBM	Randall J Bluestone/San Jose/IBM
Brian Smith/San Jose/IBM	
Wynn Price/San Jose/IBM	
Homayoun Samadi/San Jose/Contr/IBM	

Response Due to IP&L: 01/13/2000

Main Idea

<Title of disclosure (in English)>
Efficient mixing of sequential prefetches with random access data in a preexisting LRU cache

<Idea of disclosure>
1. Describe your invention, stating the problem solved (if appropriate), and indicating the advantages of using the invention.
Given an existing LRU cache for which it is impossible, or not desirable, to alter in such a way as to efficiently accommodate sequential-oriented prefetched data this invention describes a process for prefetching data in such a way as to work efficiently with random accesses in said LRU cache.

Efficient mixing of sequential prefetches with random access data in a preexisting LRU cache - continued

The advantage of this technique is that it is not always possible, or desirable, to alter the replacement algorithm of an existing LRU cache. This invention is designed to work with a preexisting LRU cache without alteration. This applies even when the LRU cache is across a physical boundary, such as a computer host attempting to make use of the cache within an I/O subsystem for efficient caching of prefetched data.

2. How does the invention solve the problem or achieve an advantage,(a description of "the invention", including figures inline as appropriate)?
The invention describes a process for estimating the single reference residency time of elements within a cache and then using that information to model the utility of keeping prefetched data for I/O streams which are expected to benefit from cache prestaging.

The I/Os eligible for signalling prefetching are recorded in a computer model. Because of the single reference residency prediction the number of simulated prefetches remains relatively small. A sequential prefetch "count" is recorded with each element in the computer model, providing a basis for decision with regards to invoking an actual prefetch into the LRU cache in question. A measure of "goodness" (based on this "count") for prefetching exists such that the threshold value for prefetching eligibility can increase or decline depending upon the LRU cache's hit-ratio performance.

3. If the same advantage or problem has been identified by others (inside/outside IBM), how have those others solved it and does your solution differ and why is it better?
I am not aware of prefetching algorithms which do not require some degree of modification to the LRU cache being prefetched into. A common "solution" is to maintain a sequential "count" (as described above) with each cache element, thus providing a measure of "goodness" for prefetch eligibility, however in every case that I am familiar with the "count" information needs to be added to the cache element information comprising the LRU cache, thus requiring a modification to the LRU cache in question.

4. If the invention is implemented in a product or prototype, include technical details, purpose, disclosure details to others and the date of that implementation.
This invention is not currently implemented in any product. I have an internal prototype which implements the algorithm. This internal prototype which is not associated with any specific product was created on 12/10/1999.

*Critical Questions (Questions 1 - 7 must be answered)

Question 1:
On what date was the invention workable? 12/10/99. Please format the date as MM/DD/YYYY (Workable means i.e. when you know that your design will solve the problem)

Question 2:
Is there any planned or actual publication or disclosure of your invention to anyone outside IBM? ○Yes ●No
If yes: Enter the name of each publication or patent and the date published below.
Publication/Patent:
Date Published or Issued:
Are you aware of any publications, products or patents that relate to this invention? ○Yes ●No
If yes: Enter the name of each publication or patent and the date published below.
Publication/Patent:
Date Published or Issued:

Question 3:
Has the subject matter of the invention or a product incorporating the invention been sold, used internally in manufacturing, announced for sale, or included in a proposal? ○Yes ●No

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Efficient mixing of sequential prefetches with random access data in a preexisting LRU cache - continued

Is a sale, use in manufacturing, product announcement, or proposal planned? ○ Yes ● No

If Yes, identify the product if known and indicate the date or planned date of sale, announcement, or proposal and to whom the sale, announcement or proposal has been or will be made.
Product
Version/Release
Code Name
Date
To Whom
If more than one, use cut and paste and append as necessary in the field provided.

Question 4
Was the subject matter of your invention or a product incorporating your invention used in public, e.g., outside IBM or in the presence of non-IBMers? ○ Yes ● No
If yes, give a date.   Please format the date as MM/DD/YYYY

Question 5
Have you ever discussed your invention with others not employed at IBM? ○ Yes ● No
If yes, identify individuals and date discussed. Fill in the text area with the following information: the names of the individuals, the employer, date discussed, under CDA, and CDA.

Question 6
Was the invention, in any way, started or developed under a government contract or project? ○ Yes ● No ○ Not sure
If Yes, enter the contract number.

Question 7
Was the invention made in the course of any alliance, joint development or other contract activities? ○ Yes ● No ○ Not Sure
If Yes, enter the following: Name of Alliance, Contractor or Joint Developer
Contract ID number
Relationship contact name
Relationship contact E-mail
Relationship contact phone

Question 8
Have you submitted, or are you aware of, any related disclosure submission? ○ Yes ● No
If Yes, please provide the title and docket or disclosure number below.

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Efficient mixing of sequential prefetches with random access data in a preexisting LRU cache - continued

Question 9
What type of companies do you expect to compete with inventions of this type? *Check all that apply*
☐ Manufacturers of enterprise servers
☐ Manufacturers of entry servers
☐ Manufacturers of workstations
☐ Manufacturers of PCs
☐ Non-computer manufacturers
☒ Developers of operating systems
☒ Developers of networking software
☒ Developers of application software
☒ Integrated solution providers
☒ Service providers
☐ Other (Please specify below)

Patent Value Tool (Optional - this may be used by the inventor and attorney to assist with the evaluat

(The Patent Value tool can be used by you or the evaluation team to determine the potential licensing value of your invention.)

The Patent Value Tool has not yet been used to calculate a score.

Evaluation

This evaluation was entered by Sarah Hamel/San Jose/Contr/IBM on 01/14/2000
Team Evaluation
What is the team's evaluation of this disclosure? Search
Date rated : 01/14/2000
Evaluation Comments

Search Information

Date sent: 01/14/2000	Target completion date:	Actual completion date: 02/09/2000
Who was the search sent to? This area is to designate a Local Searcher name or WAIPLI: JMM		
Send Search request to:	Search Type:	
Paul R Boykin/Arlington/IBM@IBMUS	☒ Patentability ☐ Clearance ☐ Validity ☐ State of Art	
Abdul Umar/Arlington/IBM@IBMUS		
Features to be Searched: Please see Disclosure. PLEASE NOTE: ADDITIONAL INFORMATION (8 PGES) FOLLOWING VIA FACSIMILE		

Post Disclosure Text & Drawings
Enter any additional information relating to this disclosure below:

(Form Revised 12/17/97)

Page 4   Printed 02/15/2000 at 09:06:22 AM